CP-2376
INDEX

19TH INTERNATIONAL COSMIC RAY CONFERENCE

LA JOLLA, USA AUGUST 11-23, 1985

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CONFERENCE PROGRAM AND AUTHOR INDEX

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19TH INTERNATIONAL COSMIC RAY CONFERENCE

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CONFERENCE PROGRAM

AND AUTHOR INDEX

PUBLICATION COMMITTEE

F.C. Jones, Chm.
J. Adams
G.M. Mason

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PREFACE

The 19th International Cosmic Ray Conference, under the auspices of the Cosmic Ray Commission of the International Union of Pure and Applied Physics, is being held on the campus of the University of California, San Diego, on 11 through 23 August 1985. In keeping with the tradition begun in 1971 by the Australian organisers of the 12th ICRC, the Proceedings of this conference are appearing in two sets of volumes. The first set, consisting of volumes 1 through 8, is being distributed to all participants at the beginning of the conference. This set contains the contributed papers. The second set, distributed after the conference, contains invited, rapporteur, and highlight papers. The papers are reproduced here exactly as they were received from the authors, without refereeing.

For the 19th ICRC, the scientific program was organised according to three major divisions-- OG (cosmic rays and gamma rays of Galactic Origin), SH (Solar and Heliosphere), and HE (High Energy). Technical papers are included in each of the three divisions.

This conference depended on funds from several agencies of the United States government, including major financial support from the National Aeronautics and Space Administration and support from the National Science Foundation, the Department of Energy, and the Air Force Geophysics Laboratory. Important financial support also came from the Center for Astrophysics and Space Sciences of the University of California, San Diego, from the California Space Institute of the University of California, from the Department of Physics and Astronomy of the University of Maryland, College park, from the International Union for Pure and Applied Physics, and from several corporate sponsors who will be acknowledged by name in the post-conference volumes.

We appreciate the confidence placed in the conference organisers by the Cosmic Ray Commission, and acknowledge with thanks the role of the Commission members in setting up the rules for the conference and in advising the organisers during its planning.

We are grateful to all of the members of the various organising committees listed at the front of this volume. The three Program Committees went to great effort to organise a coherent scientific program and to schedule four parallel sessions with a minimum of conflicts. The Local Organising Committee has worked long and hard to ensure efficient and hospitable accommodations for all the participants, both in the scientific sessions and outside them. The Publications Committee not only took great pains to assemble these volumes but also maintained an orderly data base of papers and authors which was extremely helpful to the program committees. The General Organising Committee made important contributions of ideas and efforts to make the conference possible; this committee included international representation from all of North America, thus the departure from the traditional name of National Organising Committee. And the entire effort was coordinated by the dedicated members of the Steering Committee.

Martin H. Israel, Chairman
General Organizing Committee

August, 1985

LETTER FROM THE EDITORS

This conference marks a departure from previous conferences in this series in that the publication of the Conference Papers was carried out an entire continent away from the activities of Local Organising Committee. This posed some problems but, to the considerable surprise of the Publications Committee members, the one that was expected to be the most trouble turned out not to be significant. The overwhelming majority of those submitting papers and abstracts sent them to the correct address, not to La Jolla as was feared. We wish to thank our many authors for their alertness and commend them for handling a complicated situation so well.

There are eight volumes to be distributed to the conference participants in addition to the Conference Program and Author Index: three volumes for OG, two for SH and three for HE. the detailed makeup of these volumes is described in the prefaces written by the Scientific Program chairmen for their respective volumes. Out of some 1100 abstracts that were accepted by the Scientific Program Committees for inclusion in the conference some 929 papers were finally received in time for inclusion in the Conference Papers. This represents a response of approximately 84 percent, a modest improvement. Even if one excludes the 42 one page papers that should be considered as 'confirming abstracts', even though there was no such formal category, the response was somewhat higher than that of recent years. We attribute this to the carrot of a later deadline than before coupled with the stick of there being no printing of post deadline contributed papers. We believe that this decision of the General Organising Committee was a wise one. Of course invited, rapporteur, and highlight talks will be printed in volumes to be distributed to the participants after the conference as usual.

The Publications Committee had much generous help in performing its duties: from Goddard Space Flight Center we had the help of B. Glasser, L. Harris, E. Schronce, N. Smith, J. Esposito and T. Smith. From the Naval Research Laboratory we were helped by T. Mazzotta, and at the University of Maryland M. L. Snidow and J. Mucha gave much needed assistance. Special thanks are due to Caryl Short, the lone staff member of the Publications Committee. She maintained the computer data base, organised the abstracts as they arrived, and kept track of the papers themselves to see that the finally arrived in the right place at the right time. Without her help the job would have been far more difficult than it was.

PUBLICATIONS COMMITTEE August, 1985

Frank C. Jones, Chm.
Jim Adams
Glen M. Mason

CONFERENCE PROGRAM and AUTHOR INDEX

19th INTERNATIONAL COSMIC RAY CONFERENCE
LA JOLLA, USA
AUGUST 11–23, 1985

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Department of Energy
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California Space Institute, University of California
Department of Physics and Astronomy, University of Maryland, College Park

INVITED TALKS

The Invited Talks listed here are to be given in the Mandeville Autitorium (see the Program Outline for date and time.)

D. H. Perkins (UK)	Elementary Particle Physics
R. Lingenfelter (USA)	Gamma-Ray Line Astronomy
C. J. Cesarsky (France)	Cosmic Rays and Gamma Rays in Astrophysics
C. de Jager (Netherlands)	Solar Flares and Acceleration of Energetic Particles
A. Szalay (Hungary)	The Early Universe
M. Rees (UK)	Astrophysical Jets
G. M. Raisbeck (France)	Cosmogenic Nuclei
M. Burbidge (USA)	Extragalactic Astronomy

RAPPORTEUR TALKS

The Rapporteur Talks listed here are to be given in the Mandeville Autitorium on Wednesday and Thursday, 21 and 22 August (see the Program Outline for times.)

V. Schonfelder (FRG)	OG1(2)3: Gamma Rays < 1 TeV
A. A. Watson (UK)	OG5(2): Cosmic Rays and Gamma Rays > 1 TeV
J. P. Meyer (France)	OG4(6,7,8): Cosmic Rays < 1 TeV
V. S. Ptuskin (USSR)	OG3(2,5,6,7): Sources, Acceleration, and Propagation
R. P. Lin (USA)	SH1,2,8: Solar Particles, Gamma Rays and Neutrinos
C. K. Ng (Malaysia)	SH3(1,4): Interplanetary Propagation and Acceleration
J. Kota (Hungary)	SH4: Modulation
E. O. Flueckiger (Switzerland)	SH5,6,7,9,10: Forbush Decreases, Geomagnetic and Atmospheric Effects and Cosmogenic Nuclides
L. W. Jones (USA)	HE1,6: High Energy Interactions and New Particle Searches
M. Shibata (Japan)	HE3: Emulsion Chamber Observations and Interpretation
R. W. Clay (Australia)	HE4: Extensive Air Showers
K. Sivaprasad (India)	HE5,7: Muons and Neutrinos

TOPICS

OG (ORIGIN AND GALACTIC PHENOMENA)

OG1. Gamma-Ray Bursts
OG2. Gamma-Rays from Point Sources
OG3. Diffuse Gamma-Ray Emission
OG4. Cosmic Ray Nuclei with < 1 TeV/nucleus (Composition, Spectra, and Anisotropy)
OG5. Cosmic Ray Nuclei with > 1 TeV/nucleus (Composition, Spectra, and Anisotropy)
OG6. Electrons, Positrons, and Anti-Protons
OG7. Interstellar Propagation and Nuclear Interactions
OG8. Cosmic Ray Sources and Acceleration
OG9. Techniques and Instrumentation

SH (SOLAR AND HELIOSPHERIC)

SH1. Particle Acceleration on the Sun and in the Heliosphere
SH2. Composition, Spectra, and Anisotropy
SH3. Propagatiopn of Solar and Interplanetary Energetic Particles
SH4. Solar-Cycle Modulation and Propagation of Galactic Particles in the Heliosphere
SH5. Transient Modulations
SH6. Geomagnetic and Atmospheric Effects and Response Functions
SH7. Cosmogenic Nuclides
SH8. Solar Neutrinos
SH9. Techniques
SH10. Other

HE (HIGH ENERGY)

HE1. High Energy Interactions of Particles
HE3. Cascade Phenomenology-emulsion chambers/calorimeters
HE4. Cascade Phenomenology-air showers
HE5. Muons and Neutrinos
HE6. Search for New Particles/Processes (includes monopoles, nucleon decay, fractional charge, etc.)
HE7. Experimental Techniques

OUTLINE OF THE SCIENTIFIC PROGRAM

FIRST WEEK

TUESDAY 8/13 9:00 AM	INVITED TALKS: DE JAGER CESARSKY LINGENFELTER			
2:00 PM	OG 4.3	SH 5.1	HE 1.1	OG 1.1
4:30 PM	OG 5.1	SH 4.7	HE 1.2	OG 1.2
WEDNESDAY 8/14 8:30 AM	OG 6.2	SH 1.5a	HE 3.1	HE 4.5
10:30 AM	INVITED TALKS: SZALAY HIGHLIGHT TALKS			
2:00 PM	OG 2.1	SH 1.5b	HE 3.2 HE 3.7	SH 6.1
4:00 PM	OG 2.2	SH 4.2	HE 3.3	SH 9.1
THURSDAY 8/15 8:30 AM	OG 6.1	SH 4.1	HE 3.4	OG 2.3
10:30 AM	INVITED TALKS: PERKINS HIGHLIGHT TALKS			
2:00 PM	OG 5.3	SH 4.3	HE 5.1a	HE 3.5 HE 3.6
4:00 PM	OG 9.4	SH 4.6 SH 10.1	HE 5.1b 5.2a	HE 1.3
FRIDAY 8/16 8:30 AM	OG 5.2	SH 2.1	HE 1.4	OG 2.4
10:30 AM	INVITED TALKS: REES HIGHLIGHT TALKS			
2:00 PM	OG 4.2 OG 4.1a	SH 1.2	HE 6.1	OG 2.5
4:00 PM	OG 4.1b	SH 1.1	HE 6.2a	HE 7.1
SATURDAY 8/17 8:30 AM	OG 7.2a	SH 1.3	HE 5.3a	OG 9.5
10:30 AM	OG 7.2b	SH 1.4	HE 5.3b	OG 2.6

SECOND WEEK

MONDAY 8/19 8:30 AM	OG 8.1	SH 8.1	HE 4.3	OG 3.1
10:30	OG 8.2	SH 7.1	HE 4.4	OG 9.2
2:00 PM	OG 8.3	SH 4.4	HE 4.1	OG 2.7
4:00 PM	OG 9.1	SH 4.5	HE 4.2	OG 3.2
TUESDAY 8/20 8:30 AM	OG 5.4	SH 3.1	HE 6.2	OG 9.3
10:30	INVITED TALK: RAISDECK HIGHLIGHT TALKS			
2:00 PM	OG 4.4	SH 3.2	HE 5.4	HE 4.7
4:00 PM	OG 7.1	SH 2.2	HE 5.2b	HE 4.6
WEDNESDAY 8/21 9:00 AM	INVITED TALK: BURBIDGE HIGHLIGHT TALKS			
11:00	RAPPORTEUR TALKS: SCHONFELDER WATSON			
2:00 PM	RAPPORTEUR TALKS: MEYER PTUSKIN			
4:00 PM	RAPPORTEUR TALKS: LIN NG			
THURSDAY 8/22 9:00 AM	RAPPORTEUR TALKS: KOTA FLUCKIGER			
11:00	RAPPORTEUR TALKS: JONES SHIBATA			
2:00 PM	RAPPORTEUR TALKS: CLAY SIVAPRASAD			
3:30	CLOSING CEREMONY			

CONTRIBUTED PAPER SESSIONS

SESSION 1

Tuesday 8/13/85 2:00 PM PH 108

OG 4.3

COSMIC-RAY ISOTOPES

SESSION 2

Tuesday 8/13/85 2:00 PM PH 110

SH 5.1

TRANSIENT MODULATION (FORBUSH DECREASES)

SESSION 3

Tuesday 8/13/85 2:00 PM TLH 107

HE 1.1

CROSS SECTIONS

SESSION 4

Tuesday 8/13/85 2:00 PM TLH 104

OG 1.1

GAMMA-RAY BURSTS I

SESSION 5

Tuesday 8/13/85 4:30 PM PH 108

OG 5.1

COSMIC RAYS ABOVE 1 TEV: SPECTRA AND COMPOSITION

SESSION 6

Tuesday 8/13/85 4:30 PM PH 110

SH 4.7

INTENSITY GRADIENTS AND OUTER HELIOSPHERE

SESSION 7

Tuesday 8/13/85 4:30 PM TLH 107

HE 1.2

PARTICLE PRODUCTION - MODELS AND EXPERIMENTS

CONTRIBUTED PAPER SESSIONS

SESSION 8

Tuesday 8/13/85 4:30 PM TLH 104

OG 1.2

GAMMA-RAY BURSTS II

SESSION 9

Wednesday 8/14/85 8:30 AM PH 108

OG 6.2

ELECTRONS, POSITRONS AND RADIO MEASUREMENTS OF SYNCHROTRON RADIATION

SESSION 10

Wednesday 8/14/85 8:30 AM PH 110

SH 1.5a

INTERPLANETARY ACCELERATION

SESSION 11

Wednesday 8/14/85 8:30 AM TLH 107

HE 3.1

GAMMA RAY AND HADRON SPECTRA

SESSION 12

Wednesday 8/14/85 8:30 AM TLH 104

HE 4.5

GAMMA-RAY AIR SHOWERS

SESSION 13

Wednesday 8/14/85 2:00 PM PH 108

OG 2.1

GAMMA RAYS FROM CYG X-3

SESSION 14

Wednesday 8/14/85 2:00 PM PH 110

SH 1.5b

INTERPLANETARY ACCELERATION

CONTRIBUTED PAPER SESSIONS

SESSION 15

Wednesday 8/14/85 2:00 PM TLH 107

HE 3.2, HE 3.7

C-JETS AND EMULSION CHAMBER RESULTS

SESSION 16

Wednesday 8/14/85 2:00 PM TLH 104

SH 6.1

GEOMAGNETIC AND ATMOSPHERIC EFFECTS AND RESPONSE FUNCTIONS

SESSION 17

Wednesday 8/14/85 4:00 PM PH 108

OG 2.2

GAMMA RAYS FROM CYG X-3, HERC X-1, VELA X-1, AND OTHERS

SESSION 18

Wednesday 8/14/85 4:00 PM PH 110

SH 4.2

LONG TERM MODULATION, NEUTRAL SHEET EFFECTS

SESSION 19

Wednesday 8/14/85 4:00 PM TLH 107

HE 3.3

A-JETS

SESSION 20

Wednesday 8/14/85 4:00 PM TLH 104

SH 9.1

TECHNIQUES AND INSTRUMENTATION

SESSION 21

Thursday 8/15/85 8:30 AM PH 108

OG 6.1

COSMIC-RAY ANTI PROTONS AND ANTINUCLEI

CONTRIBUTED PAPER SESSIONS

SESSION 22
Thursday 8/15/85 8:30 AM PH 110

SH 4.1

EPISODIC MODULATION

SESSION 23
Thursday 8/15/85 8:30 AM TLH 107

HE 3.4

SUPER FAMILIES I

SESSION 24
Thursday 8/15/85 8:30 AM TLH 104

OG 2.3

GAMMA RAYS FROM THE CRAB, VELA AND FAST PULSARS

SESSION 25
Thursday 8/15/85 2:00 PM PH 108

OG 5.3

COSMIC-RAY ANISOTROPY

SESSION 26
Thursday 8/15/85 2:00 PM PH 110

SH 4.3

GRADIENTS AND NORTH-SOUTH ANISOTROPY

SESSION 27
Thursday 8/15/85 2:00 PM TLH 107

HE 5.1a

UNDERGROUND MUONS

SESSION 28
Thursday 8/15/85 2:00 PM TLH 104

HE 3.5, HE 3.6

SUPER FAMILIES II AND EMULSION CHAMBER SIMULATIONS

CONTRIBUTED PAPER SESSIONS

SESSION 29

Thursday 8/15/85 4:00 PM PH 108

OG 9.4

NEW AIR SHOWER ARRAYS

SESSION 30

Thursday 8/15/85 4:00 PM PH 110

SH 4.6, SH 10.1

THE ANOMALOUS COMPONENT AND OTHER TOPICS

SESSION 31

Thursday 8/15/85 4:00 PM TLH 107

HE 5.1b, HE 5.2a

UNDERGROUND MUONS

SESSION 32

Thursday 8/15/85 4:00 PM TLH 104

HE 1.3

NUCLEI AND NUCLEAR MATTER

SESSION 33

Friday 8/16/85 8:30 AM PH 108

OG 5.2

COSMIC RAYS ABOVE 1 TEV: COMPOSITION

SESSION 34

Friday 8/16/85 8:30 AM PH 110

SH 2.1

SOLAR PARTICLES, Z > 1

SESSION 35

Friday 8/16/85 8:30 AM TLH 107

HE 1.4

NUCLEUS-NUCLEUS COLLISIONS

CONTRIBUTED PAPER SESSIONS

SESSION 36

Friday 8/16/85 8:30 AM TLH 104

OG 2.4

GAMMA RAYS FROM GEMINGA, SS433, AND CYG X-1

SESSION 37

Friday 8/16/85 2:00 PM PH 108

OG 4.1a, OG 4.2

ELEMENTAL COMPOSITION AND ENERGY SPECTRA I, H AND He ISOTOPES

SESSION 38

Friday 8/16/85 2:00 PM PH 110

SH 1.2

FLARE X-RAYS AND ELECTRONS

SESSION 39

Friday 8/16/85 2:00 PM TLH 107

HE 6.1

MAGNETIC MONOPOLES

SESSION 40

Friday 8/16/85 2:00 PM TLH 104

OG 2.5

GAMMA RAYS FROM GALACTIC SOURCES

SESSION 41

Friday 8/16/85 4:00 PM PH 108

OG 4.1b

ELEMENTAL COMPOSITION AND ENERGY SPECTRA II

SESSION 42

Friday 8/16/85 4:00 PM PH 110

SH 1.1

SOLAR FLARE ACCELERATION

CONTRIBUTED PAPER SESSIONS

SESSION 43

Friday 8/16/85 4:00 PM TLH 107

HE 6.2a

NUCLEON DECAY SEARCHES

SESSION 44

Friday 8/16/85 4:00 PM TLH 104

HE 7.1

ACOUSTIC AND THERMOLUMINESCENCE TECHNIQUES

SESSION 45

Saturday 8/17/85 8:30 AM PH 108

OG 7.2a

COSMIC-RAY PROPAGATION AND INTERACTIONS

SESSION 46

Saturday 8/17/85 8:30 AM PH 110

SH 1.3

GAMMA-RAY FLARES AND INTERPLANETARY PROTONS

SESSION 47

Saturday 8/17/85 8:30 AM TLH 107

HE 5.3a

NEUTRINOS

SESSION 48

Saturday 8/17/85 8:30 AM TLH 104

OG 9.5

AIR SHOWER TECHNIQUES

SESSION 49

Saturday 8/17/85 10:30 AM PH 108

OG 7.2b

COSMIC-RAY PROPAGATION IN THE GALAXY

CONTRIBUTED PAPER SESSIONS

SESSION 50

Saturday 8/17/85 10:30 AM PH 110

SH 1.4

SOLAR FLARE NEUTRONS

SESSION 51

Saturday 8/17/85 10:30 AM TLH 107

HE 5.3b

NEUTRINOS

SESSION 52

Saturday 8/17/85 10:30 AM TLH 104

OG 2.6

GAMMA RAYS WITH ENERGIES > 1 TEV

SESSION 53

Monday 8/19/85 8:30 AM PH 108

OG 8.1

SHOCK ACCELERATION: THEORY AND ASTROPHYSICAL SCENARIOS

SESSION 54

Monday 8/19/85 8:30 AM PH 110

SH 8.1

SOLAR NEUTRINOS

SESSION 55

Monday 8/19/85 8:30 AM TLH 107

HE 4.3

EXTENSIVE AIR SHOWERS MUONS AND ELECTRONS

SESSION 56

Monday 8/19/85 8:30 AM TLH 104

OG 3.1

DIFFUSE GALACTIC GAMMA RAYS

CONTRIBUTED PAPER SESSIONS

SESSION 57

Monday 8/19/85 10:30 AM PH 108

OG 8.2

COSMIC-RAY SOURCES AND ACCELERATION

SESSION 58

Monday 8/19/85 10:30 AM PH 110

SH 7.1

COSMOGENIC NUCLIDES

SESSION 59

Monday 8/19/85 10:30 AM TLH 107

HE 4.4

CERENKOV SIGNALS AND EXTENSIVE AIR SHOWER ENERGY CALIBRATION

SESSION 60

Monday 8/19/85 10:30 AM TLH 104

OG 9.2

GAMMA-RAY TELESCOPES

SESSION 61

Monday 8/19/85 2:00 PM PH 108

OG 8.3

COSMIC-RAY ACCELERATION AND TRANSPORT

SESSION 62

Monday 8/19/85 2:00 PM PH 110

SH 4.4

SIDEREAL AND LONG TERM MODULATION

SESSION 63

Monday 8/19/85 2:00 PM TLH 107

HE 4.1

EXTENSIVE AIR SHOWER THEORY AND SIMULATION

CONTRIBUTED PAPER SESSIONS

SESSION 64
Monday 8/19/85 2:00 PM TLH 104

OG 2.7

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SESSION 65
Monday 8/19/85 4:00 PM PH 108

OG 9.1

COSMIC-RAY INSTRUMENTS AND TECHNIQUES

SESSION 66
Monday 8/19/85 4:00 PM PH 110

SH 4.5

DIURNAL VARIATIONS

SESSION 67
Monday 8/19/85 4:00 PM TLH 107

HE 4.2

EXTENSIVE AIR SHOWER CORES AND DENSITY SPECTRA

SESSION 68
Monday 8/19/85 4:00 PM TLH 104

OG 3.2

DIFFUSE GALACTIC GAMMA-RAY LINES

SESSION 69
Tuesday 8/20/85 8:30 AM PH 108

OG 5.4

ORIGIN OF ULTRA HIGH ENERGY COSMIC RAYS

SESSION 70
Tuesday 8/20/85 8:30 AM PH 110

SH 3.1

CORONAL PROPAGATION AND ANISOTROPY

CONTRIBUTED PAPER SESSIONS

SESSION 71

Tuesday 8/20/85 8:30 AM TLH 107

HE 6.2b

NEW PARTICLE SEARCHES

SESSION 72

Tuesday 8/20/85 8:30 AM TLH 104

OG 9.3

TECHNIQUES IN GAMMA-RAY ASTRONOMY

SESSION 73

Tuesday 8/20/85 2:00 PM PH 108

OG 4.4

OBSERVATIONS OF ULTRA HEAVY COSMIC-RAY NUCLEI

SESSION 74

Tuesday 8/20/85 2:00 PM PH 110

SH 3.2

SOLAR PARTICLE PROPAGATION

SESSION 75

Tuesday 8/20/85 2:00 PM TLH 107

HE 5.4

MUONS

SESSION 76

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HE 4.7

EXTENSIVE AIR SHOWER ARRIVAL TIMES AND MINI ARRAYS

SESSION 77

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OG 7.1

PROPAGATION AND SOURCES OF ULTRA HEAVY NUCLEI

CONTRIBUTED PAPER SESSIONS

SESSION 78

Tuesday 8/20/85 4:00 PM PH 110

SH 2.2

HELIUM-3 RICH EVENTS

SESSION 79

Tuesday 8/20/85 4:00 PM TLH 107

HE 5.2b

MUONS

SESSION 80

Tuesday 8/20/85 4:00 PM TLH 104

HE 4.6b

EXTENSIVE AIR SHOWER TECHNIQUES

This conference is the 19th in a series. Previous conferences in this series were held at:

Cracow, Poland - 1947
Como, Italy - 1949
Bagneres-de-Bigorre, France - 1953
Guanjuato, Mexico - 1955
Varenna, Italy - 1957
Moscow, USSR - 1959
Kyoto, Japan - 1961
Jaipur, India - 1963
London, UK - 1965
Calgary, Canada - 1967
Budapest, Hungary - 1969
Hobart, Australia - 1971
Denver, USA - 1973
Munchen, FRG - 1975
Plovdiv, Bulgaria - 1977
Kyoto, Japan - 1979
Paris, France - 1981
Bangalore, India - 1983

CONTRIBUTED PAPER SESSIONS

SESSION 1

Tuesday 8/13/85 2:00 PM PH 108

OG 4.3

COSMIC-RAY ISOTOPES

PAPER CODE		VOL	PAGE
OG 4.3-1	GALACTIC PROPAGATION MODELS CONSISTENT WITH THE COSMIC RAY LIFETIME DERIVED FROM **10BE MEASUREMENTS TG GUZIK,JP WEFEL,M GARCIA-MUNOZ JA SIMPSON	2	76
OG 4.3-2	IMPLICATIONS OF NEW MEASUREMENTS OF **16O + P (YIELDS) **12,**13C, **14,**15N FOR THE ABUNDANCES OF C, N ISOTOPES AT THE COSMIC RAY SOURCE AG GUZIK,JP WEFEL,HJ CRAWFORD DE GREINER,J LINDSTROM,W SCHIMMERLING TJ SYMONS	2	80
OG 4.3-3	THE ISOTOPIC COMPOSITION OF COSMIC RAY CHLORINE ME WIEDENBECK	2	84
OG 4.3-4	COSMIC RAY ISOTOPE MEASUREMENTS WITH A NEW CERENKOV X TOTAL ENERGY TELESCOPE WR WEBBER,JC KISH,DA SCHRIER	2	88
OG 4.3-5	THE ISOTOPIC COMPOSITION OF COSMIC RAY CALCIUM KE KROMBEL,ME WIEDENBECK	2	92
OG 4.3-6	A NEW ANALYSIS OF COSMIC RAY ISOTOPES AT 3 GEV/N FROM HEAO3-C2 DATA P FERRANDO,P GORET,L KOCH-MIRAMOND N PETROU,A SOUTOUL	2	96
OG 4.3-7	THE ENERGY DEPENDENCE OF THE NEON-22 EXCESS IN THE COSMIC RADIATION NY HERRSTROM,N LUND	2	100

2

SESSION 1

OG 4.3-8 INITIAL RESULTS FROM THE CALTECH/DSRI BALLOON-BORNE ISOTOPE EXPERIMENT 2 103

A SCHINDLER,A BUFFINGTON,EC CHRISTIAN JE GROVE,KH LAU,EC STONE

OG 4.3-9 THE INNER GRANULOMETRIC DENSITY OF THE TRACKS IN NUCLEAR EMULSIONS AND ITS APPLICATION TO DETERMINE THE CHEMICAL SPECTRUM OF PRIMARY COSMIC RAY NUCLIDI 2 107

G ALVIAL

SESSION 2

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COSMIC-RAY ANTI PROTONS AND ANTINUCLEI

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HE 3.4-6	A BINOCULAR TYPE ATMOSPHERIC INTERACTION GENERATING SEQUENTIAL EXOTIC FEATURES NM AMATO,N ARATA,RHC MALDONADO	6	324
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OG 2.3-3	VERY HIGH ENERGY GAMMA RAYS FROM THE CRAB PULSAR OT TUMER,WA WHEATON,CP GODFREY,RC LAMB	1	139
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OG 2.3-9 1000 GEV GAMMA RAY EMISSION FROM RADIO PULSARS 1 155

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OG 2.3-10 PULSED EMISSION OF TEV GAMMA RAY FROM VELA PULSAR 1 159

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OG 2.3-12 1000 GEV GAMMA RAY EMISSION FROM MS PULSARS 1 161

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OG 5.3-6	THE SIDEREAL ANISOTROPY OF COSMIC RAYS AROUND 3.10**15 EV OBSERVED AT MIDDLE NORTH LATITUDE K MURAKAMI,T KIFUNE,N HAYASHIDA	2	250
OG 5.3-7	ARRIVAL DIRECTION DISTRIBUTION OF COSMIC RAYS OF ENERGY > 10**18EV PVJ EAMES,J LLOYD-EVANS,C MORELLO RJO REID,AA WATSON	2	254
OG 5.3-8	OBSERVATION OF ARRIVAL TIMES OF EAS WITH ENERGIES > OR EQUAL TO 6 X 10**14 EV LR SUN	2	258

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GRADIENTS AND NORTH-SOUTH ANISOTROPY

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SH 4.3-9	IMF-SENSE-DEPENDENT COSMIC RAY ANISTROPY PRODUCED FROM DIFFUSIVE-CONVECTION IN HELIOSPHERE K NAGASHIMA,K NUMAKATA,R TATSUOKA	5	9
SH 4.3-10	INFLUENCE OF THE NEUTRAL SHEET ON THE SWINSON'S TYPE NORTH-SOUTH ANISOTROPY OF COSMIC RAYS Y MUNAKATA,S SHIBATA,K HAKAMADA	5	13
SH 4.3-12	CHARACTERISTICS OF COSMIC RAY POLE - EQUATOR ANISOTROPY DERIVED FROM SPHERICAL HARMONIC ANALYSIS OF NEUTRON MONITOR DATA H TAKAHASHI,N YAHAGI,H TAKAHASHI	5	15
SH 4.3-13	FIRST ZONAL HARMONIC COMPONENT OF COSMIC RAY NEUTRON INTENSITY H TAKAHASHI,N YAHAGI,T CHIBA	5	19
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HE 5.1-2	MUON AND NEUTRINO RESULTS FROM KGF EXPERIMENT AT A DEPTH OF 7000 HG/CM**2 MR KRISHNASWAMY,MGK MENON,NK MONDAL Y HAYASHI,N ITO,S KAWAKAMI,S MIYAKE VS NARASIMHAM	8	4
HE 5.1-4	RELEVANCE OF MULTIPLE MUONS DETECTED UNDERGROUND TO THE MASS COMPOSITION OF PRIMARY COSMIC RAYS J SZABELSKI,J WDOWCZYK,AW WOLFENDALE	8	6
HE 5.1-5	MULTIMUONS EVENTS AND PRIMARY COMPOSITION BS ACHARYA,JN CAPDEVIELLE	8	8
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HE 5.1-7 A LARGE AREA COSMIC MUON DETECTOR LOCATED AT OHYA STONE MINE 8 16

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A OKADA,Y KAMIYA,I NAKMURA,S SHIBATA
H KOJIMA,S HIGASHI,T TAKAHASHI,H UMEDA
T SATO,N HIRAOKA,T SUWADA,S CHANG
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SUPER FAMILIES II AND EMULSION CHAMBER SIMULATIONS

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HE 3.5-2	A SEARCH FOR MINI-CLUSTERS IN JAPAN-USSR JOINT CHAMBER AT PAMIR JAPAN-USSR	6	352
HE 3.5-3	MINI-CLUSTERS JA CHINELLATO,C DOBRIGKEIT,J BELLANDI CMG LATTES,MJ MENON,CE NAVIA,DA PAMILAJU K SAWAYANAGI,EH SHIBUYA,A TURTELLI NM AMATO,N ARATA,FM OLIVERIRA CASTRO RHC MALDONADO,H AOKI,Y FUJIMOTO Y FUNAYAMA,S HASEGAWA,H KUMANO,H SEMBA M TAMADA,S YAMASHITA,T SHIBATA,K YOKOI A OHSAWA	6	356
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OG 9.4

NEW AIR SHOWER ARRAYS

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THE ANOMALOUS COMPONENT AND OTHER TOPICS

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SH 4.6-4	RADIAL AND LATITUDINAL GRADIENTS OF ANOMALOUS OXYGEN DURING 1977-1985 WR WEBBER,AC CUMMINGS,EC STONE	5	172
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SH 4.6-6	ON THE ANOMALOUS COMPONENT MS POTGIETER,LA FISK,MA LEE	5	180
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UNDERGROUND MUONS

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NUCLEI AND NUCLEAR MATTER

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HE 1.3-16 HEAVY FLAVOURS PRODUCTION IN QUARK-GLUON PLASMA FORMED IN HIGH ENERGY NUCLEAR REACTIONS 6 141

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COSMIC RAYS ABOVE 1 TEV: COMPOSITION

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OG 5.2-3	THE COMPOSITION OF COSMIC RAYS NEAR THEE 'BEND' (10**15 EV) FROM A STUDY MUONS IN AIR SHOWERS AT SEA LEVEL JA GOODMAN,SC GUPTA,H FREUDENREICH K SIVAPRASAD,SC TONWAR,GB YODH RW ELLSWORTH,MC GOODMAN,D BOGERT R BURNSTEIN,R FISK,S FUESS,J MORFIN T OHSKA,J BOFILL,W BUSZA,T ELDRIDGE JI FRIEDMAN,HW KENDALL,IG KOSTOULES T LYONS,R MAGAHIZ,T MATTISON,A MUKHERJEE L OSBORNE,R PITT,L ROSENSON,A SANDACZ M TARTAGLIA,FE TAYLOR	2	205
OG 5.2-4	COMPOSITION OF PRIMARY COSMIC RAYS AT ENERGIES 10**15 - 10**16 EV INFERRED FROM MT. FUJI EMULSION CHAMBER EXPERIMENT M AMENOMORI,H NANJO,E KONISHI K MIZUTANI,K KASAHARA,T KOBAYASHI E MIKUMO,K SATO,T YUDA,M SHIBATA T SHIRAI,T TAIRA,N TATEYAMA,S TORII H SUGIMOTO,K TAIRA	2	206
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HE 1.4-2	HEAVY NUCLEUS COLLISIONS BETWEEN 20 AND 60 GEV/NUCLEON	6	156
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T TOMINAGA,B WILCZYNSKA,RJ WILKES
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TA PARNELL,T SAITO,S STRAUSZ,T TABUKI
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SESSION 36

Friday 8/16/85 8:30 AM TLH 104

OG 2.4

GAMMA RAYS FROM GEMINGA, SS433, AND CYG X-1

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OG 2.4-2	PERIODIC GAMMA-RAY EMISSION FROM 'GEMINGA' AT > 10**12 EV RK KAUL,HS RAWAT,VK SANECHA,RC RANNOT ML SAPRU,AK TICKOO,RA QAZI,CL BHAT H RAZDAN,SC TONWAR	1	165
OG 2.4-3	SEARCH FOR PERIODICITIES NEAR 59 S IN THE COS-B GAMMA-RAY DATA OF 2CG 195+04 (GEMINGA) R BUCCHERI,AMT POLLOCK,K BENNETT GF BIGNAMI,PA CARAVEO,W HERMSEN HA MAYER-HASSELWANDER,B SACCO	1	169
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OG 2.4-13 LOW ENERGY GAMMA RAYS FROM CYGNUS X-1 1 193

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OG 4.1a, OG 4.2

ELEMENTAL COMPOSITION AND ENERGY SPECTRA I, H AND He ISOTOPES

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OG 4.1-2	SOURCE SPECTRAL INDEX OF HEAVY COSMIC RAY NUCLEI JJ ENGELMANN,P FERRANDO,L KOCH-MIRAMOND P MASSE,A SOUTOUL,WR WEBBER	2	4
OG 4.1-3	CHARGE AND ENERGY DEPENDENCE OF THE RESIDENCE TIME OF COSMIC RAY NUCLEI BELOW 15 GEV/NUCLEON A SOUTOUL,JJ ENGELMANN,P FERRANDO L KOCH-MIRAMOND,P MASSE,WR WEBBER	2	8
OG 4.1-4	RELATIVE ABUNDANCES OF SUB-IRON TO IRON NUCLEI IN LOW ENERGY (50-250 MEV/N) COSMIC RAYS AS OBSERVED IN THE SKYLAB EXPERIMENT N DURGAPRASAD,JS YADAV,S BISWAS	2	12
OG 4.1-5	COSMIC RAY CHARGE COMPOSITION AND ENERGY SPECTRUM MEASUREMENTS USING A NEW LARGE AREA CERENKOV X DE/DX TELESCOPE WR WEBBER,JC KISH,DA SCHRIER	2	16
OG 4.2-11	PARAMETERIZED ENERGY SPECTRUM OF COSMIC-RAY PROTONS WITH KINETIC ENERGIES DOWN TO 1 GEV LC TAN	2	72

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OG 4.2-4 RESULTS OF A SEARCH FOR DEUTERIUM AT 25-50 GV/C USING A MAGNETIC SPECTROMETER 2 68

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OG 4.2-2 MEASUREMENTS OF GALACTIC HYDROGEN AND HELIUM ISOTOPES FROM 1978 THROUGH 1963 2 60

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FLARE X-RAYS AND ELECTRONS

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SH 1.2-3	STUDY OF NON-THERMAL PHOTON PRODUCTION UNDER DIFFERENT SCENARIOS IN SOLAR FLARES: II. THE COMPTON INVERSE AND BREMSSTRAHLUNG MODELS AND FITTINGS J PEREZ-PERAZA,M ALVAREZ,A LAVILLE A GALLEGOS	4	34
SH 1.2-4	SPECTRAL AND SPATIAL PROPERTIES OF SOLAR MICROFLARES GM SIMNETT,BR DENNIS	4	38
SH 1.2-6	TEMPORAL EVOLUTION OF AN ENERGETIC ELECTRON POPULATION IN AN INHOMOGENEOUS MEDIUM. APPLICATION TO SOLAR HARD X-RAY BURSTS N VILMER,AL MACKINNON,G TROTTET	4	42
SH 1.2-7	QUANTITATIVE ANALYSIS OF FLARE ACCELERATED ELECTRONS THROUGH THEIR HARD X-RAY AND MICROWAVE RADIATION KL KLEIN,G TROTTET	4	46
SH 1.2-8	AN EXTENDED "SUPERHOT" SOLAR FLARE X-RAY SOURCE HS HUDSON,KI OHKI,S TSUNETA	4	50
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HE 6.1

MAGNETIC MONOPOLES

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GAMMA RAYS FROM GALACTIC SOURCES

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VD KOZLOV, IP KUMPAN, YUA IAPUTIN
LG MISHCHENKO, LP PAPINA, VV PLATONOV
DM PODOROZHNY, ID RAPOPORT, GA SAMSONOV
LG SMOLENSKY, VA SOBINYAKOV, VK SOKOLOV
GE TAMBOVTSEV, CHA TRETYAKOVA
YUV TRIGUBOV, IM FATEYEVA, LA KHEIN
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